

CLAIMS

- Fig. B'* →
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1. Tyre for vehicle wheels, which is provided with a tread pattern defined between two edges which are axially opposite one another relative to the equatorial plane of the tyre, said pattern comprising two lateral rows of grooves and at least one third central row arranged between said lateral rows and formed by a plurality of grooves, the grooves of each row being circumferentially spaced from one another, and the grooves of the lateral rows axially extending from the shoulders up to a predetermined distance from the equatorial plane, characterized in that:
 - all the grooves of the three rows are separate from one another so as to produce in the tread thickness a pattern which no intercommunicating paths between said grooves;
 - the ends of the grooves of the third row are far from the shoulders of the tyre;
 - the grooves of the third row extend with the end portions outside the tyre footprint, the greater dimension of each groove relative to the length of the tyre footprint causing the water drainage underneath the tyre footprint.
 2. Tyre according to Claim 1, characterized in that the maximum distance between two points of each groove of the third row, measured in the circumferential direction, is greater than the length of the tyre footprint inflated to the nominal operating pressure and subjected to the nominal load, under static conditions.
 3. Tyre according to Claim 1, characterized in that each groove of the third row comprises a substantially straight portion extending at a predetermined inclination angle with respect to a circumferential

plane between a first end far from a first shoulder and a second end far from the second shoulder.

4. Tyre according to Claim 3, characterized in that the grooves of the third row comprise two end portions of the substantially straight portion which are shaped according to curved arcs having opposite curvatures to one another.
5. Tyre according to Claim 1, characterized in that the grooves of a lateral row have a form which is different from that of the other lateral row.
6. Tyre according to Claim 1, characterized in that each groove of a first lateral row starts from the shoulder and terminates in a straight portion forming an acute angle having a predetermined value with respect to a plane parallel to the equatorial plane and having a direction opposite to that of the straight portion of each groove of the second lateral row.
7. Tyre according to Claim 1, characterized in that the grooves of a first lateral row extend from the shoulder with inclinations having, with respect to a plane parallel to the equatorial plane, a direction opposite to that of the grooves of the second lateral row.
8. Tyre according to Claim 1, characterized in that it comprises an additional fourth row of grooves which are circumferentially spaced from one another and separate from those of the other rows, the grooves of said fourth row starting from a shoulder, between two adjacent grooves of a lateral row, and terminating between two adjacent grooves of the third row.

- 5 9. Tyre according to Claim 8, characterized in that the grooves of a first lateral row and of the third row and the grooves of the fourth row and of the second lateral row form alternately with one another a first and a second trajectories which are circumferentially spaced, said trajectories having a substantially undulating shape with peaks aligned on a circumferential plane parallel to the equatorial plane, said first trajectory having an interruption between the grooves of the first and the third rows and said second trajectory having an interruption between the grooves of the fourth and the second lateral rows.
- 10 10. Tyre according to Claim 1, characterized in that it comprises a fifth internal row of grooves which are circumferentially spaced from one another and separate from all the other grooves, said third and fifth rows of grooves being symmetrical with one other relative to the equatorial plane.
- 15 20 11. Tyre for vehicle wheels, provided with a tread pattern defined between two edges which are each other axially opposite with respect to the equatorial plane of the tyre, said pattern comprising several rows of grooves at least one internal row of grooves of which being circumferentially spaced from one another, characterized in that it comprises means for acoustically signalling air pressure values lower than a predefined limit, said means consisting in the fact that the dimension, in the direction of travel, of one or more grooves of said internal row is greater than the dimension of the tyre footprint in the same direction, measured with the tyre inflated at the nominal operating pressure and subjected to the nominal load, under static conditions, so that, in the case of pressure values lower than said value,
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the tyre footprint assumes dimensions which are at least equal to those of the abovementioned grooves, causing in them firstly the air retention in the grooves, during contact with the ground, and then the instantaneous expulsion of said air outside the tyre footprint.

12. Method for checking the correct value of air pressure inside of a tyre for vehicle wheels, provided with a tread pattern defined between two edges which are axially opposite one another relative to the equatorial plane of the tyre, comprising the steps of:

a) forming in the tread pattern between the two shoulders at least one row of grooves which are circumferentially spaced from one another;

b) assigning to at least several successive grooves of said row a dimension which is greater than the tyre footprint under inflation conditions and under the nominal load;

c) checking, under static load conditions with the air pressure below the predefined value, whether length and depth dimensions of the grooves are suitable for allowing the enclosure of the air underneath the tyre footprint and the expulsion of the air with noise outside the tyre footprint;

d) in the case where the outcome of the check performed in step c) is negative, modifying the dimensions and the number of said grooves of the internal row until an acoustic signal indicating a lower air pressure inside of the tyre is produced.

13. Acoustic signalling device for vehicle wheels provided with a tread pattern comprising several groups of grooves and at least one internal row of a plurality of grooves circumferentially spaced from one another, characterized in that it comprises one

or more predetermined grooves of said internal row which have a dimension which is greater than the dimension of the tyre footprint measured with nominal air pressure values under a static load and a dimension which is smaller than or equal to the dimension of the tyre footprint measured with air pressure values lower than a predefined limit.

14. Tread band for vehicle tyres provided with a tread pattern defined between two shoulders which are axially opposite one another, relative to the equatorial plane of the tyre and comprising: at least a first and a second circumferential series of cavities extending in a direction substantially longitudinal to the direction of forward travel of the tyre, said first and second circumferential series of cavities defining an essentially continuous portion of tread band between the two shoulders and being suitable for producing a directional pattern, characterized in that the ends of the cavities of said first circumferential series are far from said shoulders.

15. Method for indicating the reduction in the inflation pressure of a tyre having a tread pattern, characterized in that it comprises at least one element of said tread pattern which is able to vary the noise level of the tread upon variation of the inflation pressure of said tyre.

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